

MATH DEPARTMENT COLLOQUIUM



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Friday, Mar 4, 2016
3:30-4:30 PM
DERR 329

Finite groups and their characters

This colloquium talk will start with the prehistory of finite group theory, and will take the audience leisurely through to some open problems in character theory of finite groups. On the way, we will note some important and curious facts. Finite group theory is distinguished by the largest theorem ever proved in the history of mathematics: The Classification of the Finite Simple Groups. Indeed, we now have an infinite list, which we believe complete, of all the finite simple groups. This includes interesting groups such as the *Monster* simple group, or the *Baby Monster*. This infinite list gives the building blocks for all finite groups. There is no hope to classify all finite groups. Homomorphisms from groups to the groups of automorphisms of vector spaces are called *representations*. Representations are classified via their characters giving rise to Character Theory of Finite Groups. The study of the characters is helped by the construction of *H*-character triple isomorphisms which relate the characters of a finite group to those of a different easier one. A number of conjectures in Character Theory relate local properties to global properties of the groups. We will discuss some of these, including the Dade Projective Conjecture and its strengthenings.

Alexandre Turull obtained his PhD from the University of Chicago under the direction of George Glauberman. He currently has the rank of Professor at the University of Florida. His research focuses on the study of finite groups, their representations, and their characters. Some particular areas of focus of his research include the finite solvable groups, and rationality questions of the characters of arbitrary finite groups. His research was supported at various times by research grants from the NSF and the NSA. His teaching has been recognized by awards at the University of Florida, including, most recently, being awarded Honors Professor of the Year in 2012.